CLAIMS:

- 1. A method for the preparation of cotton tissue comprising culturing regenerable non-embryogenic cotton callus tissue or embryogenic cotton tissue in media under dark lighting conditions, limited lighting conditions, or under green light.
- 2. The method of claim 1, wherein the dark lighting conditions or limited lighting conditions are between about 0 μEinsteins m⁻²sec⁻¹ and about 5 μEinsteins m⁻²sec⁻¹.
- 3. The method of claim 2, wherein the dark lighting conditions or limited lighting conditions are between about 0 μEinsteins m⁻²sec⁻¹ and about 2.5 μEinsteins m⁻²sec⁻¹.
- 4. The method of claim 3, wherein the dark or limited lighting conditions are about 0 μEinsteins m⁻²sec⁻¹.
- 5. The method of claim 1, wherein the regenerable non-embryogenic cotton callus tissue is derived from hypocotyl, cotyledon, root, petiole, anther, flower, or leaf.
- 6. The method of claim 5, wherein the regenerable non-embryogenic cotton callus tissue is derived from a hypocotyl.
- 7. The method of claim 1, wherein the regenerable non-embryogenic cotton callus tissue is transformed.
- 8. A method for the preparation of embryogenic cotton tissue comprising culturing regenerable non-embryogenic cotton callus tissue in media containing an antioxidant.
- 9. The method of claim 8, wherein the antioxidant is activated charcoal, ascorbic acid, citric acid, cysteine hydrochloride, dithiothreitol, glutathione, mercaptoethanol, polyvinylpyrrolidine, polyvinylpolypyrrolidine, a sulfite salt, or vitamin E.
- 10. The method of claim 9, wherein the antioxidant is ascorbic acid.
- 11. The method of claim 10, wherein the concentration of the antioxidant in the media is between about 1 mg/L and about 1000 mg/L.
- 12. The method of claim 11, wherein the concentration of the antioxidant in the media is between about 10 mg/L and 100 mg/L.
- 13. The method of claim 8, wherein the regenerable non-embryogenic cotton callus tissue is transformed.

- 14. A method for the preparation of embryogenic cotton tissue comprising culturing regenerable non-embryogenic cotton callus tissue in media containing an ethylene inhibitor.
- 15. The method of claim 14, wherein the ethylene inhibitor is acetylsalicylic acid, aminoethoxyvinylglycine, amino-oxyacetic acid, 2,4-dinitrophenol, a cobalt salt, a nickel salt, 2,4-norbornadiene, salicylic acid, silver nitrate, or silver thiosulfate.
- 16. The method of claim 15, wherein the ethylene inhibitor is aminoethoxyvinylglycine.
- 17. The method of claim 16, wherein the concentration of the ethylene inhibitor in the media is between about 1 mM and about 100 mM.
- 18. The method of claim 17, wherein the concentration of the ethylene inhibitor in the media is between about 3 mM and about 10 mM.
- 19. The method of claim 14, wherein the regenerable non-embryogenic cotton callus tissue is transformed.
- 20. A method for the preparation of embryogenic cotton tissue comprising culturing transformed regenerable non-embryogenic cotton callus tissue in media containing an antioxidant and an ethylene inhibitor under dark lighting conditions, limited lighting conditions, or under green light.
- 21. The method of claim 20, wherein the ethylene inhibitor is aminoethoxyvinylglycine.
- 22. The method of claim 20, wherein: the antioxidant is ascorbic acid; and the ethylene inhibitor is aminoethoxyvinylglycine.
- 23. The method of claim 22, wherein the dark or limited lighting conditions are between about 0 μEinsteins m⁻²sec⁻¹ and about 5 μEinsteins m⁻²sec⁻¹.
- 24. The method of claim 23, wherein the dark or limited lighting conditions are between about 0 μEinsteins m⁻²sec⁻¹ and about 2.5 μEinsteins m⁻²sec⁻¹.
- 25. The method of claim 24, wherein the dark or limited lighting conditions are about 0 μEinsteins m⁻²sec⁻¹.
- 26. The method of claim 20, wherein the regenerable non-embryogenic cotton callus tissue is transformed.

- 27. The method of claim 20, wherein the regenerable non-embryogenic cotton callus tissue is derived from callus, hypocotyl, cotyledon, root, petiole, anther, or leaf.
- 28. A method for the preparation of transgenic cotton embryos comprising culturing transgenic embryogenic cotton tissue in media, wherein the media contains a support matrix.
- 29. The method of claim 28, wherein the support matrix is a silica/alumina chip, cloth, felt, or filter paper.
- 30. The method of claim 28, wherein the support matrix is filter paper.
- 31. A method for the preparation of transgenic cotton embryos comprising: culturing transformed regenerable non-embryogenic cotton callus tissue in media containing an antioxidant and an ethylene inhibitor under dark lighting conditions, limited lighting conditions, or under green light, to produce transgenic embryogenic cotton tissue; and culturing the transgenic embryogenic cotton tissue on a support matrix.
- 32. The method of claim 31, wherein the ethylene inhibitor is aminoethoxyvinylglycine.
- 33. The method of claim 31, wherein: the antioxidant is ascorbic acid; and the ethylene inhibitor is aminoethoxyvinylglycine.
- 34. The method of claim 31, wherein the dark or limited lighting conditions are between about 0 μEinsteins m⁻²sec⁻¹ and about 5 μEinsteins m⁻²sec⁻¹.
- 35. The method of claim 31, wherein the support matrix is filter paper.
- 36. A method for the preparation of transgenic cotton embryos comprising culturing transgenic embryogenic cotton tissue in media containing an amino acid hydrolysate supplement.
- 37. The method of claim 36, wherein the concentration of the amino acid supplement in the media is between about 10 mg/L and about 500 mg/L.
- 38. The method of claim 37, wherein the concentration of the amino acid supplement in the media is between about 50 mg/L and about 150 mg/L
- 39. A method for the preparation of cotton embryos comprising culturing regenerable non-embryogenic cotton callus tissue in media containing an antioxidant and an ethylene inhibitor under dark lighting conditions, limited lighting conditions, or under green light, to produce embryogenic cotton tissue;

- and culturing the embryogenic cotton tissue in media containing a support matrix and an amino acid hydrolysate supplement.
- 40. The method of claim 39, wherein the ethylene inhibitor is aminoethoxyvinylglycine.
- 41. The method of claim 39, wherein the antioxidant is ascorbic acid; and the ethylene inhibitor is aminoethoxyvinylglycine.
- 42. The method of claim 39, wherein the dark or limited lighting conditions are between about 0 μEinsteins m⁻²sec⁻¹ and about 5 μEinsteins m⁻²sec⁻¹.
- 43. The method of claim 39, wherein the support matrix is filter paper.
- 44. The method of claim 39, wherein the concentration of the amino acid supplement in the media is between about 10 mg/L and about 500 mg/L.
- 45. A method for the preparation of transgenic cotton embryos comprising culturing transgenic embryonic cotton tissue under dark lighting conditions, limited lighting conditions, or under green light and wrapped with a sealing material.
- 46. The method of claim 45, wherein the dark lighting conditions or limited lighting conditions are between about 0 μEinsteins m⁻²sec⁻¹ and about 5 μEinsteins m⁻²sec⁻¹.
- 47. The method of claim 46, wherein the dark lighting conditions or limited lighting conditions are between about 0 μEinsteins m⁻²sec⁻¹ and about 2.5 μEinsteins m⁻²sec⁻¹.
- 48. The method of claim 47, wherein the dark or limited lighting conditions are about 0 μEinsteins m⁻²sec⁻¹.
- 49. The method of claim 45, wherein the sealing material is Parafilm M.
- 50. A method for the preparation of cotton embryos comprising culturing regenerable non-embryogenic cotton callus tissue in media containing an antioxidant and an ethylene inhibitor under dark lighting conditions, limited lighting conditions, or under green light, to produce embryogenic cotton tissue; and culturing the embryogenic cotton tissue in media containing a support matrix and an amino acid hydrolysate supplement under dark lighting conditions, limited lighting conditions or under green light and wrapped with a sealing material.
- 51. The method of claim 50, wherein the ethylene inhibitor is aminoethoxyvinylglycine.

- 52. The method of claim 50, wherein the antioxidant is ascorbic acid; and the ethylene inhibitor is aminoethoxyvinylglycine.
- 53. The method of claim 50, wherein the dark lighting conditions or limited lighting conditions are between about 0 μEinsteins m⁻²sec⁻¹ and about 5 μEinsteins m⁻²sec⁻¹.
- 54. The method of claim 50, wherein the support matrix is filter paper.
- A method for the preparation of germinated transgenic cotton embryos comprising culturing transgenic cotton embryos in germination media containing a carbohydrate between a concentration of about 0.05% (w/v) and about 1% (w/v), wherein the carbohydrate is glucose, sucrose, fructose maltose, mannose, or xylose.
- 56. The method of claim 55, wherein the concentration of the carbohydrate is between about 0.1% (w/v) and about 0.5% (w/v).
- 57. The method of claim 55, wherein the carbohydrate is glucose.
- 58. A method for the preparation of transgenic cotton plants comprising:
 - (a) culturing transformed regenerable non-embryogenic cotton callus tissue in media containing an antioxidant and an ethylene inhibitor under dark lighting conditions, limited lighting conditions, or under green light, to produce transgenic embryogenic cotton tissue;
 - (b) culturing the transgenic embryogenic cotton tissue in media containing a support matrix and amino acid hydrolysate supplement under dark lighting conditions, limited lighting conditions, or under green light and wrapped in a sealing material, to produce transgenic cotton embryos; and
 - (c) culturing the transgenic cotton embryos in germination media containing glucose or sucrose, wherein the concentration of the glucose or sucrose is at a concentration between about 0.05% (w/v) and about 1% (w/v).